



MEMORANDUM
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To: ISIM Design Team
ISIM Co-Is

This memo revises and clarifies baseline assumptions for the ISIM focal plane arrays (FPAs) reported previously in the NGST study team report "Visiting A Time When Galaxies Were Young" and also in the Jan 98 SRB review package.

Baseline InSb FPAs

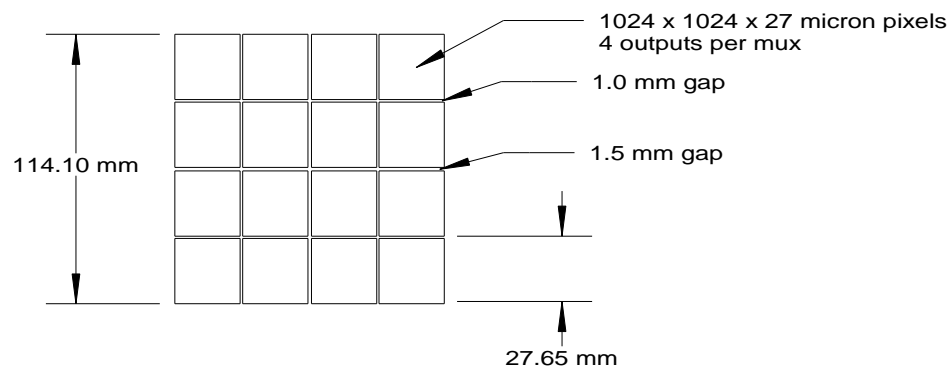
- 1) The baseline format is 1024 x 1024 x 27 μ m pixels with muxes laid out for edge butting along two perpendicular sides. These building blocks will be arrayed on a mother board to form a 4096 x 4096 FPA as shown in the top portion of the attached figure. A total of 5 such FPAs are required: 1 for each of 4 cameras and 1 for a spectrometer. It is anticipated that each mother board will require several hundred electrical leads.
- 2) The 1024 x 1024 building blocks will be arrayed with a 1.0 mm gap along edge butts and a 1.5 mm gap along edges containing I/O. As a consequence, the active area of each FPA is 114.1 x 114.1 mm.
- 3) Each 1024 x 1024 mux will have 4 outputs for a total of 64 outputs per mother board.
- 4) Each 1024 x 1024 mux will have two separate operating modes: science mode and guiding mode. The four camera FPAs together contain a total of 64 1024 x 1024 building block elements. At any given time, 63 of these will be operating in science mode and 1 will be operating in guiding mode. It is a requirement that guiding mode can be assigned to any one of the 64 building blocks.
- 5) In guiding mode, a 10 x 10 pixel area will be read at a rate of 100 Hz. It is a requirement that this 10 x 10 pixel window can be assigned to any portion of the 1024 x 1024 array. We do not plan to use any portion of the array outside of this window to collect science data.

- 6) In science mode, the arrays will be configured for maximum sensitivity and will be read at a rate of 5 μ s per pixel.
- 7) “Sampling up the ramp” type non-destructive readout will be used during both guiding and science modes.
- 8) Although it is desired that all of the InSb FPAs be identical, guiding mode operation is only required on 4 of the 5 mother boards (i.e., not required on the spectrometer FPA).
- 9) The baseline power dissipation for each 1024 x 1024 building block is 2 mW. The total InSb power dissipation is 160 mW. No duty cycle should be applied to this number for thermal modeling.
- 10) The baseline operating temperature for the InSb FPAs is: 32 K.
- 11) The baseline A/D is 16 bit with number of detector outputs per A/D left to design team discretion.

Baseline Si:As FPAs

- 12) The baseline format is 512 x 512 x 27 μ m pixels with muxes laid out for edge butting along two perpendicular sides. These building blocks will be arrayed on a mother board to form a 1024 x 1024 FPA. One such FPA is required.
- 13) Each 512 x 512 mux will have 4 outputs for a total of 16 outputs per mother board. The baseline read rate is 5 μ s per pixel. Guiding mode operation is not required.
- 14) The baseline power dissipation for the 1024 x 1024 mother board is 2 mW.
- 15) The baseline operating temperature for the Si:As FPA is 6 K.
- 16) Again, the baseline A/D is 16 bit with number of detector outputs per A/D left to design team discretion.

ISIM NIR Camera FPA (1 of 4)



TOTAL FOV (4 Cameras) 1.07 arc-sec/mm

